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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,960	03/26/2004	Frank Olschewski	21295.78 (H5780US)	7913
29127	7590	12/06/2007	EXAMINER	
HOUSTON ELISEEVA			ROSARIO, DENNIS	
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LEXINGTON, MA 02421				
			ART UNIT	PAPER NUMBER
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			MAIL DATE	DELIVERY MODE
			12/06/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/809,960

Applicant(s)

OLSCHEWSKI ET AL.

Examiner

Dennis Rosario

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment was received on 10/16/07. Claims 1-10 are pending.

### ***Claim Objections***

2. Due to the amendment, the objection to claims 3, 4, 7, 8, 9, 10 are withdrawn.

### ***Claim Rejections - 35 USC § 112***

3. Due to the amendment, the rejection of claims 4, 9 and 10 under 35 USC 112 is withdrawn.

### ***Response to Arguments***

4. Applicant's arguments on page 6, 4<sup>th</sup> paragraph filed 10/16/07 have been fully considered but they are not persuasive and states:

**“...the element of user defining virtual reference subjects of Claim 1 is absent in Garakani.”**

In light of using the Broadest Reasonable Interpretation (MPEP 2111), the examiner respectfully disagrees. Given the definition of “A virtual reference subject of Claim 1 is a location or group of locations in an image or sequence of images [Remarks, page 5, last paragraph],” the examiner can compare the meaning of the claimed “virtual reference subject” with the teachings of Garakani.

Garakani teaches the meaning of claimed virtual reference subject as a **“place (emphasis added) in a...number of frames”** in [0178], line 5, which is the same as the location in an image as defined by the applicant as the virtual reference subject, and teaches a user defining (via “user preferences” in [0178]) virtual reference subjects (or “events taking place in...frames” in [0178] which are defined by the user preferences).

5. Applicant's arguments on page 6, 8<sup>th</sup> paragraph have been fully considered but they are not persuasive and states:

**“...Garakani does not show user defining regions within images.”**

The examiner respectfully disagrees for the same reason as paragraph 4, above.

6. Applicant's arguments on page 6, 9<sup>th</sup> paragraph have been fully considered but they are not persuasive and states:

**“...the element of ‘in order to define regions’ of Claim 1 is absent in Garakani.”**

The examiner respectfully disagrees since Garakani identifies “brightness” in [0187], line 8 in order to define regions or “locate objects” in [0187], line 9 that naturally include a region.

7. Applicant's arguments on page 7, 5<sup>th</sup> paragraph have been fully considered but they are not persuasive and states:

**“...Garakani does not show any motion of the grayscale values from one image to the next, and; therefore, it does not show the optical flux of Claim 1.”**

The examiner respectfully disagrees since Garakani does show motion (via “motion detectors” in [0129], line 7) of the grayscale values (or “intensity” in [0129], line 7) from one image to the next (corresponding to “subsequent frames” in [0129], line 8), and; therefore, does show the optical flux of Claim 1.

In addition, fig. 3, num. 303 uses “luminance” in [0120], line 2 which corresponds “a motion field from at least two images” in [0036], line 7 and to the claimed optical flux.

Furthermore, Garakani teaches that images or frames have “gray values” in [0196], line 5 which correspond to “every pixel” in [0195], line 5 which are used to find a “motion vector” in [0193], line 1. Thus, motion vectors correspond to the claimed optical flux which both describes motion between frames based on gray values.

8. Applicant’s arguments on page 7, 6<sup>th</sup> paragraph have been fully considered but they are not persuasive and states:

**"The elements of user defining virtual reference subjects [or location(s)] within acquired images in order to define regions; of optical flux; of applying the identified optical flux to the defined reference subjects; and of performing interactions on the reference subject modified by the optical flux of Claim 1 are not taught...in Garakani."**

The examiner respectfully disagrees since Garakani teaches

- a) The elements of user defining virtual reference subjects (or temporal locations as shown in fig. 1, num. 108 and represented in fig. 3 as "Images") within acquired images (fig. 1,num. 106) in order to define (via fig. 1,num. 103) regions (as shown by two objects in fig. 1,num. 107 that correspond to the objects of fig. 1,num. 108);
- b) optical flux (see paragraph 7, above);
- c) applying (via fig. 3,numerals 306 and 307 and 309) the identified optical flux (as identified upon the output of fig. 3,num. 303) to the defined reference subject (as represented by the output of fig. 3,num. 304); and
- d) performing interactions (or "analy-ses" in [0205], lines 7,8 corresponding to fig. 3, numerals 306 and 308) on the reference subject modified by the optical flux (or a motion vector that is used to "define a bounding box" in [0205], line 2 in said reference subjects for said analyses).

9. Applicant's arguments on page 8, 4<sup>th</sup> paragraph have been fully considered but they are not persuasive since claim 6 is not a method claim. Only the structural limitations were given weight and not the functional limitations in system claim 6 (see MPEP 2114).

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Garakani et al. (US Patent Application Publication No.: 2003/0185450 A1).

Regarding claim 1, Garakani discloses a method for performing interactions, using a microscope, on microscopic subjects that change in space and time, comprising:

- a) acquiring at least one image (as shown in fig. 1,num 107.) of a sample that encompasses at least one microscopic subject;
- b) defining by the user virtual reference subjects (or “window size” in paragraph [0184], line 4 and see paragraph 4, above) on a discrete grid (as shown in fig. 6,num. 601) of the acquired image or images, in order to define regions (as shown within fig. 1,num. 107);
- c) automatic acquiring of a sequence of image data (as shown in fig. 1,num. 108) or volume data;
- d) successive identifying an optical flux (as shown in fig. 6,num. 605 and see paragraph 7, above) based on the sequence of acquired images;
- e) applying the identified optical flux to the defined reference subjects (as shown in fig. 6, num. 605 that is along “Image i+2” as shown in fig. 6 which corresponds to said window size); and
- f) performing interactions (as shown by an arrow similar to 605 that represents said flux that passes through said “image i+2” and “image i+1” as shown in fig. 6) on the reference subject modified (the window is modified since as arrow is used to associate the window to other windows and see paragraph 8, above for limitations e) and f)) by the optical flux.



Regarding claim 2, Garakani discloses the method as defined in claim 1, wherein the virtual reference subjects are:

- a) regions (fig. 6, numerals 602-604),
- b) discrete point sets, or
- c) local coordinate systems on the reference grid of the image sequence,  
and
- d) define interaction locations (that “share” in [0173], line 7).

Regarding claim 3, Garakani discloses the method as defined in claim 1, wherein the interactions encompass:

- a) a recovery ( or “reconstructed” in [0111], line 10) of measured data of the subject or
- b) a controlled manipulation of the subject at the positions defined by the virtual reference subjects.

Regarding claim 4, Garakani discloses the method as defined in claim 3, wherein the recovery of the measured data comprises

- a) image data (as shown in fig. 1,num. 107);
- b) geometrical data of the virtual reference subject, such as center point, area, periphery, or
- c) volume, or
- d) magnitudes derived from geometrical data of the virtual reference subject, comprising at least one of velocity, acceleration, volume and area growth rates, and
- e) collision statistics of virtual reference subjects; and
- c) determination of:
  - c1) the intensity (via a equation in [0125]) within the region defined by the virtual reference subject, by acquisition of an intensity distribution function (said equation) and
  - c2) any desired parameters (or “frequency” in [0126]) derived therefrom (said equation), such as mean, variance, skewness, or higher elements, as well as
  - c3) other parameters common in statistics (or “estimate” in [0127], line 2) such as quantile, median, or range width.

Regarding claim 5, the rejection of claim 5 is moot due to an “or” limitation of claim 3.

Regarding claim 6, Garakani discloses a system for interactions on microscopic subjects that change in space and time comprising:

- a) a confocal scanning microscope (fig.1, num. 102) that guides an illuminating light beam over a subject;
- b) several detectors (fig. 1,num. 109) that identify, from the light proceeding from the subject, intensities from different spectral regions;
- c) a processing unit (fig. 2A,num. 202);
- d) a PC (fig. 2A,num. 204);
- e) an input unit (fig. 1,num. 105);
- f) a display (fig. 1,num. 104) on which an individual image is presented to the user; the user interactively defines virtual reference subjects on the image shown on the display, using the input unit for position definition;
- g) a means for determining the optical flux (fig. 3,num. 303) based on the intensities from different spectral regions identified by the detectors is housed in the processing unit; and
- h) a means for applying the optical flux (any numeral of fig. 3 except 303) to the virtual reference subjects is present in the processing unit and the processing unit controls interactions on the basis of the changed reference subjects.

Claim 7 is rejected the same as claim 2. Thus, argument similar to that presented above for claim 2 is equally applicable to claim 7.

Regarding claim 8, Garakani discloses the system as defined in claim 6, wherein the interactions (a “Broadest Reasonable Interpretation” is being applied, see MPEP 2111, since the claimed “interaction” was defined in the specification in paragraph [02]) accomplishes both:

- a) a recovery of measured data of a subject (as discussed in claim 3, above) and
- b) the controlled manipulation (via fig. 2A,num. 204) of the subject at the positions defined by the virtual reference subjects.

Claim 9 is rejected the same as claim 4. Thus, argument similar to that presented above for claim 4 is equally applicable to claim 9.

Regarding claim 10, Garakani discloses the system as defined in claim 9, wherein the controlled manipulation of the subject is accomplished with respect to:

- a) the specific regions (as shown in fig. 6,num. 603) or positions in the subject,
- b) the manipulation by means of radiation (“radiation” in [0242], second to last line), for purposes of bleaching, photoactivation, cage-compound release, and cutting and excision.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yang (US Patent 5,859,700) is pertinent as teaching a method of using the claimed virtual reference subject as shown by a white dot in the lower left of fig. 6 and "motility research" in col. 23, line 13 which corresponds to the claimed optical flux.

Glukhovsky et al. (US Patent 6,944,316 B2) is pertinent as teaching a method of the motility research shown in fig. 4, num. 216.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario whose telephone number is (571) 272-7397. The examiner can normally be reached on 9-5.

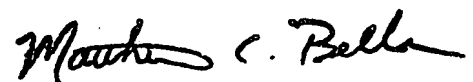
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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